

Structural characteristics of the subducting Kyushu-Palau ridge around the Hyuga-nada region in Nankai Trough revealed by seismic reflection imaging

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Great earthquakes with tsunamis with recurrence intervals of 100–200 years have occurred along the Nankai Trough near central Japan. Hyuga-nada is located in the western margin of Nankai Trough, where the Kyushu-Palau ridge (KPR) which is remnant arc constructed by backarc spreading in Shikoku Basin is subducting. Recent ocean-bottom monitoring results have also yielded presence of the episodic low-frequency tremor associated with the activity of very-low-frequency earthquakes (VLFs) at shallow plate interface at the northern end of subducting KPR. It is important to investigate the crustal structure of subducting KPR for understanding the mechanism of VLFs in Nankai Trough.

Japan Agency for Marine-Earth Science and Technology carried out a dense high-resolution seismic reflection survey over 600 km of line length around the northern end of KPR from Sep. to Oct. 2016 using R/V Yokosuka.

Beneath the accretionary prism where VLFs are active, we observed the convex structure corresponding to the subducting Kyushu Palau Ridge. The distribution of trench-fill sediments is limited to only the east side of KPR. It is difficult to trace the frontal thrust close to KPR. There is no deformation structure in the trench-fill sediments from the trench axis to the seaward region around KPR. Our results suggest that subducting KPR contributes to the deformation process around the trench axis.

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